

Basements and Lowest Floors in the Flood Fringe of the Floodplain

Development in the floodplain is regulated by the local zoning authority. Within the flood fringe, structures (i.e., buildings) must be designed, permitted, and built to meet the minimum elevation requirements for the “lowest floor.” The lowest floor is the walking surface of the lowest enclosed area and includes basements and crawlspaces, where present. This information sheet provides a summary of the lowest floor standards for several common building types.

Lowest floor minimum requirements

New buildings are not allowed in the floodway but may be permitted in the flood fringe. When in the flood fringe, the top of the building’s lowest floor must be elevated to or above the Regulatory Flood Protection Elevation (RFPE). After construction, the as-built elevation of the lowest floor must be certified by a professional engineer, surveyor or other qualified individual. These lowest floor requirements apply to all enclosed building spaces, including those that are not habitable, are unfinished or have low ceiling heights. To learn more about the RFPE, see the info box on Page 3.

Elevating the lowest floor on fill is a permitted use in the flood fringe. Examples are highlighted in Figures 1 and 2.

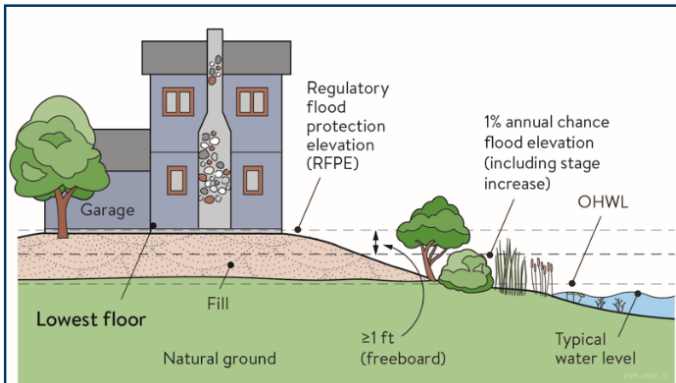


Figure 1. Top of finished first floor surface is lowest floor. A concrete slab on grade is permitted for a new home in the flood fringe if the top of the lowest floor is at or above the RFPE.

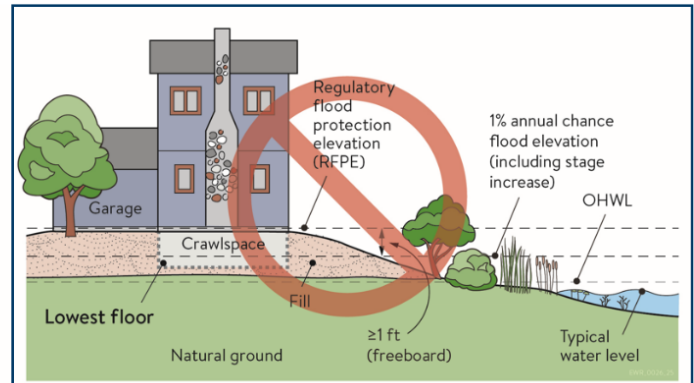


Figure 2. Top of basement or subgrade crawl space is lowest floor. This example is not permitted for a new home in the flood fringe because the basement or subgrade crawl space is the lowest floor and is below the RFPE.

What is the flood fringe?

The flood fringe is that part of regulatory floodplain lying outside of the floodway, as shown on the Flood Insurance Rate Map (FIRM). This area is generally covered by shallow, slow-moving flood waters. Floodplains where the FIRM does not show the floodway and flood fringe must be treated as all floodway until a permit applicant has provided certain engineering information to verify a proposed building site is outside of the floodway. In some cases, an area may be considered flood fringe without engineering information if the community approves use of “standard engineering practices,” which should also be approved by the DNR. Examples of standard engineering practices include sites that are obvious backwater areas, ineffective flow areas near bridge and culvert crossings, and using the Ordinary High Water Level (OHWL) on lakes and wetlands to mark the floodway boundary.



What about walkout basements?

A walkout basement is not a “basement,” based on the federal definition of this term (and the meaning used in local floodplain ordinances). The Federal Emergency Management Agency (FEMA) defines a “basement” as any area of a structure, including crawl spaces, having its floor below ground level on all sides, regardless of the depth below ground. The typical walkout basement, however, has one whole side and connecting floor that is at or above ground level and therefore does not meet this definition. So, if a proposed walkout basement level is at or above the RFPE, the local zoning authority may permit the building. See a typical walkout basement example in Figure 3.

[Note: Digging to create a walkout basement can, in some cases, expand the floodplain boundary and accidentally put a house that was not originally in the floodplain, into the floodplain, thus creating a violation. To avoid this, care should be taken to ensure that high ground above the base flood elevation (BFE) remains between the basement excavation and the floodplain boundary. An example of this type of violation is shown in Figure 4.]

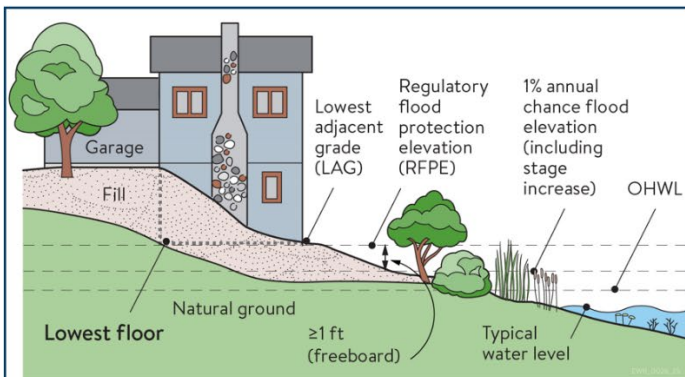


Figure 3. Top of walkout basement is lowest floor. A walkout basement is permitted for a home in the flood fringe if the walkout side is at or above ground level and the top of the lowest floor is above the RFPE.

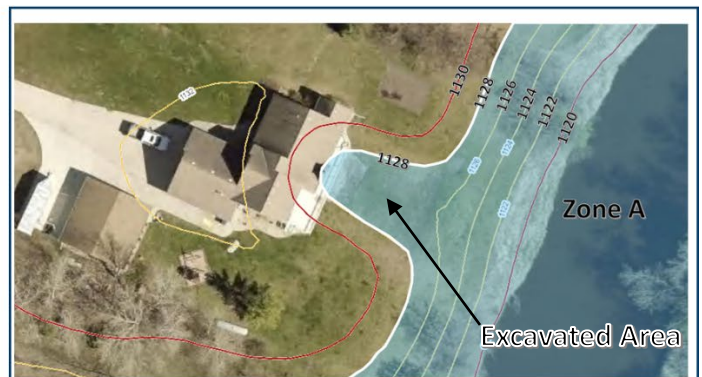


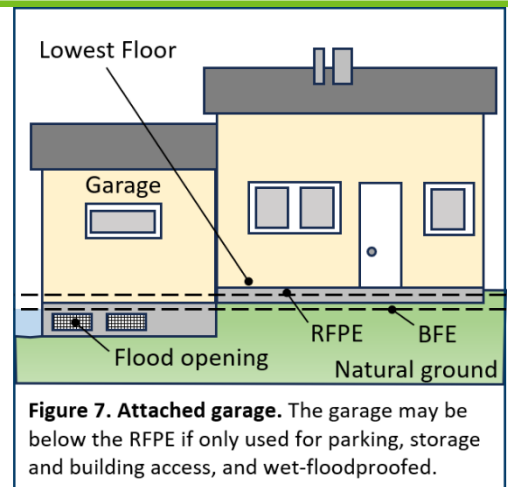
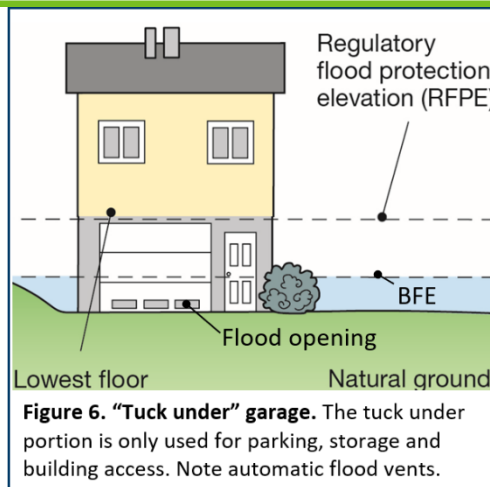
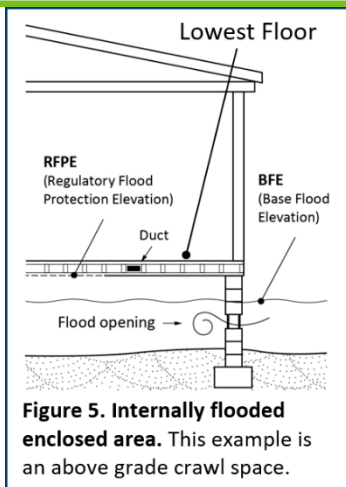
Figure 4. With a BFE of 1128 feet, this building was originally out of the floodplain, but the landowner dug themselves into the floodplain (see the affected contour lines) by adding a walkout basement and now must meet floodplain regulations.

Special Cases for Basements and Lowest Floors

Elevating lowest floors using “alternative methods.” Instead of using fill, a structure’s lowest floor may be elevated to or above the RFPE using certain allowable and permittable alternative methods. These alternative methods include, but are not limited to, internally-flooded or wet-floodproofed enclosed areas such as above grade crawl spaces, attached garages and tuck under garages. Enclosures like these are not considered the lowest floor of the building if the space is used only for vehicle parking, building access or storage and the design meets the following standards:

- The floor of the enclosed area must be at or above the exterior grade on at least one side of the structure.
- Automatic non-engineered flood vent openings that allow entry and exit of floodwaters without human intervention are installed on at least two sides of the building. These vents must be sized to have a minimum net area (i.e., excluding vent slats or screens from the calculation) of 1 sq. in. of vent opening for every 1 sq. ft. of internal area subject to flooding and be installed no more than 1 ft. above grade. Alternatively, engineered openings certified for an equivalent size may be used. See [FEMA Technical Bulletin 1](#) for more details.
- Communities may only allow alternative methods to elevate the lowest floor as a conditional use permit.
- A deed restricted non-conversion agreement and periodic inspections are recommended, and are required by many communities.

Common alternative methods used to elevate the lowest floor of a building are shown in Figures 5, 6 and 7.



Dry-floodproofed (watertight) basements. Federal regulations allow *nonresidential* buildings to have a basement's lowest floor below the RFPE, provided it is designed as a watertight enclosure meeting the following standards:

- The basement walls are substantially impermeable to water with structural components having the capacity to resist hydrostatic and hydrodynamic loads and the effects of buoyancy, at least up to the RFPE.
- The basement design meets the standards of [FEMA Technical Bulletin 3](#).
- The basement design is certified by a registered professional engineer or architect, verifying the design meets these standards.

However, dry-floodproofed *residential* basements below the RFPE are **prohibited** unless FEMA has issued a formal basement exception in the community, which is rare, or the community has amended its floodplain management ordinance to adopt the provisions of [FEMA Technical Bulletin 10](#).

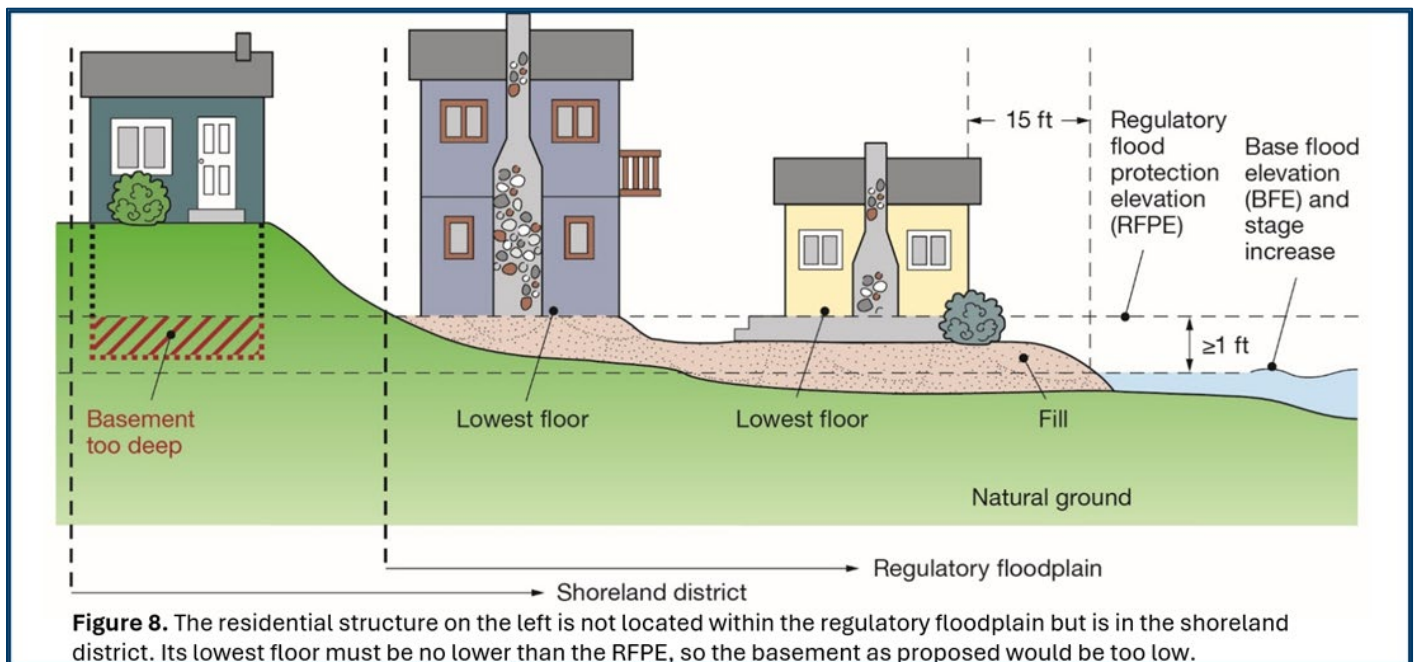
The [Regulatory Flood Protection Elevation](#), or RFPE, is the minimum elevation to which a building's lowest floor, utilities and other facilities in the regulatory floodplain must be elevated. It is defined as an elevation that is 1 ft. (i.e., freeboard) above the 1% annual chance (100-year) flood elevation *plus* any stage increase due to establishing a floodway (up to 0.5 ft.).

What is the RFPE?

Pre-FIRM and newly mapped buildings with basements. "Pre-FIRM" refers to buildings built before the effective date of the community's first Flood Insurance Rate Map (FIRM), while "newly mapped" refers to a building once designated outside the floodplain, but following a map revision is now designated within the floodplain. Pre-FIRM and newly mapped buildings with basements below the RFPE are allowed to be maintained and repaired as nonconformities if permitted by the local zoning authority and the work is not a substantial improvement. These buildings, if built on naturally high ground, may also be eligible for a Letter of Map Amendment (LOMA), despite having a basement below the RFPE. Properties with LOMAs are, however, still subject to all other local floodplain permit requirements.

Lowest floors for accessory structures. For information on the lowest floor requirements for accessory structures in the floodplain, see [Floodplain Information Sheet 5](#), “Residential Accessory Structures in the Flood Fringe of the Floodplain: Sheds, Detached Garages and Other Structures.”

Lowest floors for buildings outside the mapped floodplain, including areas within Shoreland Districts. Low-lying areas below the BFE that are outside of and adjacent to mapped floodplains are in the regulatory floodplain and subject to the lowest floor standard. In addition, communities that have adopted a shoreland management ordinance must also regulate the lowest floor of buildings. Within the shoreland district, the lowest floor must be at or above the RFPE when this elevation is known. Where this elevation is unavailable, the lowest floor elevation must be at least 3 ft. above the ordinary high water level (OHWL) or the highest known water level (HKWL), whichever is greater. This shoreland standard applies both in and outside of the regulatory floodplain, see Figure 8. To learn more about calculating the lowest floor elevation on lakes, please see [Floodplain Informational Sheet 1](#), “Estimating the 100-Year (1% Annual Chance) Flood Elevation on Lakes.”



Related definitions

Base Flood Elevation (BFE) – Same as the 1% annual chance (100-year) flood elevation.

Letter of Map Amendment (LOMA) – An official amendment by FEMA that indicates a property is not within the 1% annual chance (100-year) floodplain. In Minnesota, a LOMA **does not** remove a property from the floodplain for permitting purposes and, therefore, any proposed development or improvements must be compliant with local floodplain regulations.

Lowest Floor – The lowest floor of the lowest enclosed area (including basements and crawl spaces).

Ordinary High Water Level (OHWL) – An elevation that delineates the boundary of public waters.

Shoreland District – Land located within 1,000 feet from a lake and 300 feet from a river, or the landward extent of a floodplain designated by ordinance, whichever is greater.

Substantial Improvement – Any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the unimproved structure.